



Satellite Data Analysis for Ocean Sciences

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This summer I worked with the Penn Climate Group under the direction of Professor Irina Marinov. The group's research revolves around studying Earth's oceans and its impacts on climate, and how changes in current ocean composition could impact future global climate. In particular, oceanographers are interested in both the biological and chemical composition of the ocean, as well as the interactions between the two. My project focused on analyzing data collected from satellites over the past several years in search of any interesting trends.

One of the variables of high interest to oceanographers is the amount of phytoplankton biomass in the ocean. Because collecting this data in the ocean would be physically impossible, researchers have instead relied on remote sensing through satellites to obtain reasonably accurate measurements. Other variables of interest derived from satellites that I have analyzed include ocean chlorophyll content, carbon content, and light levels over the past decade and a half.

My data analysis took place primarily in MATLAB. Working with such large amounts of data over the summer taught me a lot about the importance of finding ways to visualize the data. From many perspectives, data dumps can look like a big mess, but by viewing them in a particular way, significant results can become clear. Another thing I learned about was the care required to ensure data integrity. Every step of working with data has to be done with care to ensure we don't see any false results.

Besides working in MATLAB manipulating and visualizing data, working in the climate group this summer has also given me an opportunity to join in on group meetings where other projects and ideas were discussed. I had a fair share of reading scientific papers, getting lost in the technical jargon, but ever so slowly getting better at understanding the field and some of its dynamics. I have no doubt that both the technical skills and the research skills I have learned will be of great use in any of my future research experiences.